CLAIMS

1.   A pillar-shaped honeycomb structural body mainly made of porous ceramics, in which a plurality of through holes are placed in parallel with one another in the length direction with a partition wall interposed therebetween,

wherein

said plurality of through holes comprises:

a group of inlet-side through holes, whose ends are sealed by plugs at the outlet side such that the total sum of areas on cross sections perpendicular to the length direction is made relatively greater; and

a group of outlet-side through holes, whose ends are sealed by plugs at the inlet side such that the total sum of areas on the cross sections thereof is made relatively smaller,

supposing that the aperture rate on the inlet side is X (%) and that the total sum of thermal capacities of the plugs which seal the group of inlet-side through holes at 500°C per 11.8 cm^2 of the end face on the outlet side containing the group of the outlet-side through holes is represented by Y (J/K),

the relationship indicated by the following inequalities (1) and (2) being satisfied.

$$0.0157X - 0.0678 < Y < 1.15X - 5 \ldots (1)$$
$$35 \leq X \leq 60 \ldots (2)$$

2.   The honeycomb structural body according to claim 1, wherein

supposing that the total sum of thermal capacities of the plugs which seal the group of inlet-side through holes at 25°C per 11.8 cm^2 of the end face on the outlet side containing the group of the outlet-side through holes is represented by Z (J/K), a relationship indicated by the following inequality (3) is satisfied.

$$0.013X - 0.09 < Z < 0.7X - 2.5 \ldots (3)$$

3.   The honeycomb structural body according to claim 1 or 2,
       wherein
       a relationship indicated by the following inequality (4)
is further satisfied.

5        $0.05X - 0.55 < Y < 0.574X - 2 ... (4)$

4.   The honeycomb structural body according to claim 3,
       wherein
       a relationship indicated by the following inequality (5)
10 is further satisfied.
         $0.05X - 0.55 < Z < 0.354X - 1 ... (5)$

5.   The honeycomb structural body according to any one of
claims 1 to 4,
15   wherein
       said porous ceramic is porous silicon carbide.

6.   A honeycomb structural body,
       wherein
20   a sealing material layer is formed on a circumferential
face of a honeycomb block that is formed by combining a plurality
of honeycomb structural bodies according to any one of claims
1 to 5 through a sealing material layer with one another.